

CLAIMS

1. A liquid ejecting apparatus comprising:

a movable head that is provided with a plurality of
5 nozzles for ejecting a liquid;

a carry unit for carrying a medium in a predetermined
carrying direction; and

a sensor for detecting an edge of said medium;

wherein said liquid ejecting apparatus controls
10 ejection of said liquid from said plurality of nozzles in
accordance with a result of the detection of said sensor;
and

wherein a position, in the carrying direction, of said
sensor is at the same position of or on an upstream side
15 of a nozzle located most upstream in said carrying
direction, of among said plurality of nozzles.

2. A liquid ejecting apparatus comprising:

a movable head that is provided with a plurality of
20 nozzles for ejecting a liquid;

a carry unit for carrying a medium in a predetermined
carrying direction; and

a sensor for detecting an edge of said medium;

wherein said liquid ejecting apparatus controls
25 ejection of said liquid from said plurality of nozzles in
accordance with a result of the detection of said sensor;

wherein, due to a detection error in said sensor that
occurs when said sensor detects the edge of said medium,
a position of the edge of said medium when said edge is
30 detected fluctuates within a range from a first position
to a second position; and

wherein a position, in said carrying direction, of

a nozzle located most upstream in said carrying direction, of among said plurality of nozzles, is between said first position and said second position.

- 5 3. A liquid ejecting apparatus according to claim 2, wherein the position, in said carrying direction, of said nozzle located most upstream in said carrying direction is in the middle of said first position and said second position.

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4. A liquid ejecting apparatus according to claim 2, wherein said sensor detects the edge of said medium; and

wherein, based on a result of this detection, the
15 liquid is kept from being ejected from said nozzle located most upstream in said carrying direction and nozzles located within a predetermined distance from that nozzle in said carrying direction.

- 20 5. A liquid ejecting apparatus according to claim 4, wherein, after said sensor detects the edge of said medium, a process of carrying said medium in said carrying direction using said carry unit and a process of moving said head and ejecting the liquid onto said medium are
25 repeated for a predetermined number of times, and then ejection of the liquid onto said medium is ended.

6. A liquid ejecting apparatus according to claim 5, wherein the predetermined number of times is a plural
30 number of times; and

wherein the predetermined distance in the process of ejecting the liquid onto said medium is increased in

correspondence with an increase in an aggregate carry amount of said medium after the detection of the edge of said medium.

5 7. A liquid ejecting apparatus according to claim 6,
 wherein said predetermined distance is a value
 obtained by subtracting a predetermined amount from said
 aggregate carry amount.

10 8. A liquid ejecting apparatus according to claim 7,
 wherein, the higher the precision of detection with
 which the edge of said medium is detected is, the smaller
 said predetermined amount is made.

15 9. A liquid ejecting apparatus according to claim 2,
 wherein the edge of said medium is detected by
 determining whether or not the edge of said medium had
 passed a predetermining position in said carrying
 direction.

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10. A liquid ejecting apparatus according to claim 9,
 wherein said liquid ejecting apparatus further
 comprises a medium-supporting section for supporting said
 medium;

25 wherein said sensor is provided with a light-emitting
 section for emitting light toward said medium-supporting
 section, and a light-receiving section for receiving the
 light that has been emitted from said light-emitting
 section; and

30 wherein, by determining, based on an output value of
 said light-receiving section, whether or not said medium
 is in a traveling direction of the light emitted from said

light-emitting section, it is determined whether or not said edge had passed the predetermined position in said carrying direction.

5 11. A liquid ejecting apparatus according to claim 10,
wherein the light is emitted from said light-emitting
section toward a plurality of positions different from one
another in a direction of movement of said head; and
wherein, based on the output value of said
10 light-receiving section that has received the emitted
light, it is determined whether or not said medium is in
said traveling direction of the light.

12. A liquid ejecting apparatus according to claim 11,
15 wherein said sensor is provided in/on a movable moving
member;

wherein the light is emitted from said light-emitting
section toward said plurality of positions while moving
said moving member; and

20 wherein, based on the output value of said
light-receiving section that has received the emitted
light, it is determined whether or not said medium is in
said traveling direction of the light.

25 13. A liquid ejecting apparatus according to claim 12,
wherein said head is provided in/on said moving
member; and

wherein, while moving said moving member,

30 the light is emitted from said
light-emitting section toward said plurality of
positions,

based on the output value of said

light-receiving sensor that has received the emitted light, it is determined whether or not said medium is in said traveling direction of the light, and

5 the liquid is ejected from said nozzles provided in said head.

14. A liquid ejecting apparatus according to claim 2,
 wherein said liquid is ejected with respect to an
10 entire surface of said medium.

15. A liquid ejecting apparatus according to claim 2,
 wherein said liquid is ink; and
 wherein said liquid ejecting apparatus is a printing
15 apparatus that prints on a medium to be printed, which serves as said medium, by ejecting the ink from said nozzles.

16. A liquid ejecting apparatus comprising:
20 a movable head that is provided with a plurality of nozzles for ejecting an ink;
 a carry unit for carrying a medium to be printed in a predetermined carrying direction; and
 a sensor for detecting an edge of said medium to be
25 printed;

 wherein said liquid ejecting apparatus controls ejection of said ink from said plurality of nozzles in accordance with a result of the detection of said sensor;
 wherein, due to a detection error in said sensor that
30 occurs when said sensor detects the edge of said medium to be printed, a position of the edge of said medium to be printed when said edge is detected fluctuates within

a range from a first position to a second position;

wherein a position, in said carrying direction, of a nozzle located most upstream in said carrying direction, of among said plurality of nozzles, is in the middle of
5 said first position and said second position;

wherein, based on the result of the detection, the ink is kept from being ejected from said nozzle located most upstream in said carrying direction and nozzles located within a predetermined distance from that nozzle
10 in said carrying direction;

wherein, after said sensor detects the edge of said medium to be printed, a process of carrying said medium to be printed in said carrying direction using said carry unit and a process of moving said head and ejecting the
15 ink onto said medium to be printed are repeated for a predetermined number of times, and then ejection of the ink onto said medium to be printed is ended;

wherein the predetermined number of times is a plural number of times;

20 wherein the predetermined distance in the process of ejecting the ink onto said medium to be printed is increased in correspondence with an increase in an aggregate carry amount of said medium to be printed after the detection of the edge of said medium to be printed;

25 wherein said predetermined distance is a value obtained by subtracting a predetermined amount from said aggregate carry amount;

wherein, the higher the precision of detection with which the edge of said medium to be printed is detected
30 is, the smaller said predetermined amount is made;

wherein the edge of said medium to be printed is detected by determining whether or not the edge of said

medium to be printed had passed a predetermining position in said carrying direction;

wherein said liquid ejecting apparatus further comprises a supporting section for supporting said medium
5 to be printed;

wherein said sensor is provided with a light-emitting section for emitting light toward said supporting section, and a light-receiving section for receiving the light that has been emitted from said light-emitting section;

10 wherein, by determining, based on an output value of said light-receiving section, whether or not said medium to be printed is in a traveling direction of the light emitted from said light-emitting section, it is determined whether or not said edge had passed the predetermined
15 position in said carrying direction;

wherein the light is emitted from said light-emitting section toward a plurality of positions different from one another in a direction of movement of said head;

wherein, based on the output value of said
20 light-receiving section that has received the emitted light, it is determined whether or not said medium to be printed is in said traveling direction of the light;

wherein said sensor is provided in/on a movable moving member;

25 wherein the light is emitted from said light-emitting section toward said plurality of positions while moving said moving member;

wherein, based on the output value of said light-receiving section that has received the emitted
30 light, it is determined whether or not said medium to be printed is in said traveling direction of the light;

wherein said head is provided in/on said moving

member;

wherein, while moving said moving member,

the light is emitted from said
light-emitting section toward said plurality of
positions,

based on the output value of said
light-receiving sensor that has received the
emitted light, it is determined whether or not
said medium to be printed is in said traveling
direction of the light, and

the ink is ejected from said nozzles
provided in said head;

wherein said ink is ejected with respect to an entire
surface of said medium to be printed; and

wherein said liquid ejecting apparatus is a printing
apparatus that prints on said medium to be printed by
ejecting the ink from said nozzles.

17. A printing system comprising:

a main computer unit; and

a liquid ejecting apparatus that is connectable to
said main computer unit and that is provided with

a movable head that is provided with a
plurality of nozzles for ejecting a liquid;

a carry unit for carrying a medium in a
predetermined carrying direction; and

a sensor for detecting an edge of said
medium;

wherein said liquid ejecting apparatus controls
ejection of said liquid from said plurality of nozzles in
accordance with a result of the detection of said sensor;
and

wherein a position, in the carrying direction, of said sensor is at the same position of or on an upstream side of a nozzle located most upstream in said carrying direction, of among said plurality of nozzles.

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18. A liquid ejecting apparatus comprising:

a movable head that is provided with a plurality of nozzles for ejecting a liquid;

a carry unit for carrying a medium in a predetermined
10 carrying direction; and

a sensor for detecting an edge of said medium and that is movable with said head;

wherein said liquid ejecting apparatus controls
ejection of said liquid from said plurality of nozzles in
15 accordance with a result of the detection of said sensor;
and

wherein a position, in the carrying direction, of said sensor is at the same position of or on an upstream side of a nozzle located most upstream in said carrying
20 direction, of among said plurality of nozzles.

19. A liquid ejecting apparatus comprising:

a movable head that is provided with a plurality of nozzles for ejecting a liquid;

25 a carry unit for carrying a medium in a predetermined carrying direction; and

a sensor for detecting an edge of said medium and that is movable with said head;

wherein said liquid ejecting apparatus controls
30 ejection of said liquid from said plurality of nozzles in accordance with a result of the detection of said sensor;
and

wherein a position, in the carrying direction, of said sensor is on an upstream side of a nozzle located most upstream in said carrying direction, of among said plurality of nozzles.

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20. A liquid ejecting apparatus according to claim 19, wherein said sensor detects a lateral edge of said medium; and

10 wherein said liquid ejecting apparatus controls ejection of the liquid from said plurality of nozzles in accordance with a position of the lateral edge of said medium that has been detected.

21. A liquid ejecting apparatus according to claim 20,
15 wherein a position, on the most downstream side in said carrying direction, of a detection region of said sensor is located on the upstream side, in said carrying direction, of said nozzle located most upstream in said carrying direction.

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22. A liquid ejecting apparatus according to claim 19, wherein said carry unit carries said medium by a predetermined carry amount in said carrying direction; and

25 wherein the position, in the carrying direction, of said sensor is on the upstream side, in said carrying direction, away from said nozzle located most upstream in said carrying direction by more than said carry amount.

23. A liquid ejecting apparatus according to claim 22,
30 wherein said liquid ejecting apparatus ejects the liquid onto the edge of said medium using a portion of said plurality of nozzles after said sensor no longer detects

said medium.

24. A liquid ejecting apparatus according to claim 23,
wherein said liquid ejecting apparatus ejects the
5 liquid onto said medium using all of said plurality of
nozzles in a state where said sensor no longer detects said
medium, and

after said carry unit has further carried said medium
by said carry amount, said liquid ejecting apparatus ejects
10 said liquid onto the edge of said medium using a portion
of said plurality of nozzles.

25. A liquid ejecting apparatus according to claim 22,
wherein a position, on the most downstream side in
15 said carrying direction, of a detection region of said
sensor is on the upstream side, in said carrying direction,
away from said nozzle located most upstream in said
carrying direction by more than said carry amount.

20 26. A liquid ejecting apparatus according to claim 19,
wherein said carry unit has a carry roller for
carrying said medium up to a position where said liquid
can be ejected onto said medium; and

wherein the position, in the carrying direction, of
25 said sensor is on the downstream side of said carry roller.

27. A liquid ejecting apparatus according to claim 26,
wherein a process of correcting a skew in said medium
is performed on the upstream side of said carry roller.

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28. A liquid ejecting apparatus according to claim 26,
wherein a position, on the most upstream side in said

carrying direction, of a detection region of said sensor is on the downstream side, in said carrying direction, of said carry roller.

5 29. A liquid ejecting apparatus according to claim 26, wherein said liquid ejecting apparatus further comprises a supporting section for supporting said medium that is carried from said carry roller; and wherein said sensor is arranged such that a detection
10 region of said sensor is located on said supporting section.

30. A liquid ejecting apparatus according to claim 29, wherein calibration of said sensor is performed based
15 on an output signal of said sensor in a state in which said supporting section is not supporting said medium.

31. A liquid ejecting apparatus according to claim 29, wherein a position, on the most upstream side in said
20 carrying direction, of the detection region of said sensor is on said supporting section.

32. A liquid ejecting apparatus according to claim 29, wherein said carry unit carries said medium in a
25 slanted manner with respect to said supporting section; and

wherein the position of said sensor is on the downstream side, in said carrying direction, of a position at which a front edge of said medium first comes into contact
30 with said supporting section.

33. A liquid ejecting apparatus according to claim 32,

wherein said carry unit has a paper discharge roller for discharging said medium; and

wherein said medium that has been carried in a slanted manner with respect to said supporting section passes a
5 print region within which the liquid ejected from said nozzles land, and then reaches said paper discharge roller.

34. A liquid ejecting apparatus according to claim 32,
wherein a position, on the most upstream side in said
10 carrying direction, of the detection region of said sensor is on the downstream side, in said carrying direction, of the position at which the front edge of said medium first comes into contact with said supporting section.

15 35. A liquid ejecting apparatus according to claim 19,
wherein said liquid is ink; and
wherein said liquid ejecting apparatus is a printing apparatus that prints on a medium to be printed, which serves as said medium, by ejecting the ink from said
20 nozzles.

36. A liquid ejecting apparatus comprising:
a movable head that is provided with a plurality of nozzles for ejecting an ink;
25 a carry unit for carrying a medium to be printed in a predetermined carrying direction; and
a sensor for detecting an edge of said medium to be printed and that is movable with said head;
wherein said liquid ejecting apparatus controls
30 ejection of said ink from said plurality of nozzles in accordance with a result of the detection of said sensor;
wherein a position, in the carrying direction, of said

sensor is on an upstream side of a nozzle located most upstream in said carrying direction, of among said plurality of nozzles;

5 wherein said sensor detects a lateral edge of said medium to be printed;

wherein said liquid ejecting apparatus controls ejection of the ink from said plurality of nozzles in accordance with a position of the lateral edge of said medium to be printed that has been detected;

10 wherein a position, on the most downstream side in said carrying direction, of a detection region of said sensor is located on the upstream side, in said carrying direction, of said nozzle located most upstream in said carrying direction;

15 wherein said carry unit carries said medium to be printed by a predetermined carry amount in said carrying direction;

wherein the position, in the carrying direction, of said sensor is on the upstream side, in said carrying direction, away from said nozzle located most upstream in said carrying direction by more than said carry amount;

20 wherein said liquid ejecting apparatus ejects the ink onto the edge of said medium to be printed using a portion of said plurality of nozzles after said sensor no longer detects said medium to be printed;

25 wherein said liquid ejecting apparatus ejects the ink onto said medium to be printed using all of said plurality of nozzles in a state where said sensor no longer detects said medium to be printed, and

30 after said carry unit has further carried said medium to be printed by said carry amount, said liquid ejecting apparatus ejects said ink onto the edge of said medium to

be printed using a portion of said plurality of nozzles;

wherein the position, on the most downstream side in said carrying direction, of the detection region of said sensor is on the upstream side, in said carrying direction,

5 away from said nozzle located most upstream in said carrying direction by more than said carry amount;

wherein said carry unit has a carry roller for carrying said medium to be printed up to a position where said ink can be ejected onto said medium to be printed;

10 wherein the position, in the carrying direction, of said sensor is on the downstream side of said carry roller;

wherein a process of correcting a skew in said medium to be printed is performed on the upstream side of said carry roller;

15 wherein a position, on the most upstream side in said carrying direction, of the detection region of said sensor is on the downstream side, in said carrying direction, of said carry roller;

wherein said liquid ejecting apparatus further
20 comprises a supporting section for supporting said medium to be printed that is carried from said carry roller;

wherein said sensor is arranged such that the detection region of said sensor is located on said supporting section;

25 wherein calibration of said sensor is performed based on an output signal of said sensor in a state in which said supporting section is not supporting said medium to be printed;

wherein the position, on the most upstream side in
30 said carrying direction, of the detection region of said sensor is on said supporting section;

wherein said carry unit carries said medium to be

printed in a slanted manner with respect to said supporting section;

wherein the position of said sensor is on the downstream side, in said carrying direction, of a position at which a front edge of said medium to be printed first comes into contact with said supporting section;

wherein said carry unit has a paper discharge roller for discharging said medium to be printed;

wherein said medium to be printed that has been carried in a slanted manner with respect to said supporting section passes a print region within which the ink ejected from said nozzles land, and then reaches said paper discharge roller;

wherein the position, on the most upstream side in said carrying direction, of the detection region of said sensor is on the downstream side, in said carrying direction, of the position at which the front edge of said medium to be printed first comes into contact with said supporting section; and

wherein said liquid ejecting apparatus is a printing apparatus that prints on said medium to be printed by ejecting the ink from said nozzles.

37. A printing system comprising:

a main computer unit; and

a liquid ejecting apparatus that is connectable to said main computer unit and that is provided with

a movable head that is provided with a plurality of nozzles for ejecting a liquid;

a carry unit for carrying a medium in a predetermined carrying direction; and

a sensor for detecting an edge of said